Preston & Wingham Primary Schools Federation

Learning together, we grow kind hearts and healthy minds.

Knowledge Progression: Materials and Physics

Year	Materials	Light and Sound	Forces and Electricity
1	**Everyday Materials** • Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass metal, water and rock. • Describe the simple physical properties of a variety of everyday materials. • Compare and group together a variety of everyday materials on the basis of their simple physical properties. • Perform simple tests to explore which material would be best suited to a specific purpose.		
2	**Uses of Everyday Materials** • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made some materials can be changed by squashing, bending, twisting and stretching. • Recognise why it is important to recycle and reuse plastic • Describe how scientists have invented new materials. (eg. Macintosh, Dunlop, McAdam)		
3 W 3/4P	**Rocks, Fossils and Soils** • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Begin to understand how igneous, sedimentary and metamorphic rocks are formed. • Relate the simple physical properties of some rocks to their formation.	**Light and Shadow** • Name a number of light sources, including the sun. • Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Explore the way light is reflected from a mirror. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.	**Forces and Magnets** • Understand different types of forces, including pushes, pulls, gravity and friction. • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetism can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others.

	• Explore that different rocks react differently to forces (eg. Rubbing, water). • Describe in simple terms how fossils are formed when things that have lived are trapped in rock. • Recognise that soils are made from rocks and organic matter.	• Recognise that shadows are formed when light is blocked by an opaque object. • Find patterns in the way that the size of shadows change.	• Compare and group together everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having two poles. • Predict whether two magnets will attract or repel, depending on which poles are facing.
Year			
4W 4/5P (A)	**Solids, Liquids and Gases** • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe materials change when they are heated or cooled. • Measure or research the temperature at which this happens in degrees Celsius. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. •	• **Sound and Vibrations** • Identify how sounds are made, associating some of them with something vibrating. • Recognise vibrations from sounds travels through a medium to the ear. • Find patterns between the pitch of a sound and features of an object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produce it. • Recognise that sounds get fainter as the distance from the sound source increases.	**Electricity 4W only** • Identify appliances that run on electricity and describe some of the dangers of mains electricity. • Construct a simple series electrical circuit, identifying and naming basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, based on whether it is part of a complete loop with a battery. • Know that a switch can open/close a circuit. • Recognise some common conductors and insulators, and associate metals with being conductors.
5 4/5P (B)	**Changing Materials** • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	**Earth and Space** • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Describe the movement of the Moon relative to the Earth. • Describe the Sun, Earth and Moon as approximately spherical bodies. • Use the idea of the earth's rotation to explain the day and night and the apparent movement of the sun across the sky. • Explain how ideas about the solar system have changed over time.	**Forces** • Recognise that more than one force can act on an object. • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effects of air resistance, water resistance and friction between moving surfaces. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. • Explore how levers, pulleys and gears are used in everyday life (e.g. describe how having gears can make it easier to pedal a bike).

	• Demonstrate that dissolving, mixing and changes of state are reversible changes • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.		
6		**Light** • Recognise that light appears to travel in straight lines. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • Draw diagrams to illustrate how light is travelling from the source to the eye. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. • Know that, when sunlight passes through some objects, coloured light is produced (for example in rainbows, soap bubbles and prisms).	**Electricity W (P-Y4/Y6)** • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of the switches. • Use and recognise symbols when representing a simple circuit in a diagram. • Explore the thickness of a wire in a circuit. • Know how to stay safe when using electricity.